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DONALD J. LENKSZUS
PO BOX 3064
CAREFREE, AZ 85377-3064

EXAMINER	
HO, TU TU V	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/631,027	DRY, JOEL M.	
	Examiner	Art Unit	
	Tu-Tu Ho	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-63* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *05/09/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections § 102 & § 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in
(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. **Claims 1-3, 5, 7, 17, 22-24, 26, 28, 38, 43-45, 47, 49, and 59** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over the '491 patent (cited in the previous Office Action).

The '491 patent discloses in Figures 1-5 and respective portions of the specification a device as claimed or substantially as claimed.

Referring to **claim 1**, the '491 patent discloses a light source comprising:

an elongate member (12, "internally hollowed, elongate and substantially cylindrical shaft 12 which is constructed of a strong, lightweight and resilient aluminum composite", column 3, lines 5-10) having an outer surface;

at least one solid-state light source (24, LED elements, paragraph bridging column 1 and 2) carried on said elongate member outer surface (as clearly depicted in Fig. 3; despite an aperture for receiving the solid-state light source, the solid-state light source is seen as being carried on said elongate member outer surface since the solid-state light source is not sunk below the elongate member outer surface); and

one or more electrical conductors (70, Fig. 2 or 84, Fig. 4) carried by said elongate member and connected to said at least one solid-state light source to supply electrical power thereto.

Referring to **claim 2** and using the same references, citations, and interpretations as detailed above for claim 1 where applicable, the '491 patent discloses a light source comprising:

an elongate member having an outer surface;

a plurality of solid-state light source (24, 26,...) carried on said elongate member outer surface, at least some of said solid-state light sources being disposed in a first plane and others of said solid-state light sources being disposed in a second plane not coextensive with said first plane; and

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of solid-state light sources to supply electrical power thereto.

By similar citations and explanations, and with reference to **claims 22-23 and 43-44**, the '491 patent discloses a radiation emitting source comprising a plurality of radiation emitting

semiconductor devices and a plurality of radiation emitting solid-state devices as claimed. In particular, the reference discloses a radiation emitting source comprising:

an elongate member 12 having an outer surface;

a plurality of radiation emitting semiconductor devices 24, 26, ...or a plurality of radiation emitting solid-state devices 24, 26, ... carried on said elongate member outer surface, at least some of said radiation emitting semiconductor devices or said radiation emitting solid-state devices being disposed in a first plane and others of said radiation emitting semiconductor devices or said radiation emitting solid-state devices being disposed in a second plane not coextensive with said first plane; and

electrical conductors carried by said elongate member and connected to said radiation emitting semiconductor devices or said radiation emitting solid-state devices to supply electrical power thereto;

However, the reference does not explicitly discloses that the elongate member is an elongate thermally conductive member as claimed, and thus further fails to explicitly disclose that the elongate member is configured to conduct heat away from said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices to fluid contained by said elongate member.

Nevertheless, the reference discloses that said solid-state light sources or said radiation emitting semiconductor devices or said radiation emitting solid-state devices are high intensity lighting devices (paragraph bridging columns 1 and 2), and high intensity lighting devices are associated with harmful high thermal dissipation as is known in the art (see, for example,

Yamamoto et al. U.S. Patent 6,707,073, column 1, last paragraph), and harmful high thermal dissipation requires some sorts of cooling as is common knowledge and as is known in the art (see, for example, Kalua U.S. Patent Application Publication 2002/0122134, paragraph [0003] or, for example, Zhang U.S. Patent 6,715,900, column 1, lines 14-65). Therefore, the '491 patent's elongate member, which carriers the high intensity lighting devices, to function as disclosed, appears to be an elongate thermally conductive member. In the alternative, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the '491 patent's elongate member so that it is an elongate thermally conductive member, so as to dissipate the harmful thermal energy released from the high intensity lighting devices.

As for the material of the '491 patent's elongate member, which is disclosed as "aluminum composite", although it is true that some special aluminum composites may be poor heat conductors; the aluminum composite of the '491 patent's elongate member ought to be a thermally conductive member so that the high intensity lighting elements - which produce harmful heat, which harmful heat needs to be dissipated - function as disclosed. For a disclosure of an aluminum composite with good thermal dissipation characteristics, see, for example, Hamayoshi et al. U.S. Patent 6,077,327, column 1, lines 5-67).

Therefore, although not disclosed in so many words as detailed above, the elongate member of the reference's radiation source either inherently comprises or seems to comprise the limitation "thermally conduct" and that the elongate thermally conductive member is configured or appears to be configured to conduct heat away from said at least one or said plurality of said solid-state light sources or from said radiation emitting semiconductor devices or from said

radiation emitting solid-state devices to fluid naturally contained by said elongate thermally conductive member.

Referring to **claims 3, 17, 24, 38, 45, and 59**, the internally hollowed, elongate and substantially cylindrical shaft 12 of the '491 patent inherently comprises air, which is a thermal transfer media, since the reference fails to disclose otherwise.

Referring to **claims 5, 26, and 47**, the internally hollowed, elongate and substantially cylindrical shaft 12 of the '491 patent comprises a tube.

Referring to **claims 7, 28, and 49**, the '491 patent further discloses in Figure 3 that said tube has a cross-section having flat portions.

2. **Claims 1-3, 5-7, 11-17, 20-24, 26-28, 32-38, 41-45, 47-49, 53-59, and 62-63** are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zhang U.S. Patent 6,715,900 (the '900 patent).

The '900 patent discloses in the figures, particularly Fig. 1, and respective portions of the specification a device as claimed or substantially as claimed.

Referring to **claim 1**, the '900 patent discloses a light source comprising:

an elongate thermally conductive member ("supporting frame" 21, made of a good heat conduction material, column 3, lines 38-39) having an outer surface ("peripheral surface" 213, column 3, lines 30-32);

at least one solid-state light source ("high efficiency solid-state light source", column 1, lines 4-10, or "luminary element" 222, column 3, lines 30-35) carried on said elongate member outer surface (best seen in Figs. 2 and 4); and

one or more electrical conductors ("electrodes" 220, best seen in Figs. 1 and 4) carried by said elongate member and connected to said at least one solid-state light source to supply electrical power thereto ("carried by" in interpreted broadly).

Referring to **claim 2** and using the same references, citations, and interpretations as detailed above for claim 1 where applicable, the '900 patent discloses a light source comprising:

an elongate member having an outer surface;

a plurality of solid-state light source (222) carried on said elongate member outer surface, at least some of said solid-state light sources being disposed in a first plane and others of said solid-state light sources being disposed in a second plane not coextensive with said first plane; and

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of solid-state light sources to supply electrical power thereto.

By similar citations and explanations, and with reference to **claims 22-23 and 43-44**, the '900 patent discloses a radiation emitting source comprising a plurality of radiation emitting semiconductor devices and a plurality of radiation emitting solid-state devices as claimed. In particular, the reference discloses a radiation emitting source comprising:

an elongate member having an outer surface;

a plurality of radiation emitting semiconductor devices (222) or a plurality of radiation emitting solid-state devices (222) carried on said elongate member outer surface, at least some of said radiation emitting semiconductor devices or said radiation emitting solid-state devices being disposed in a first plane and others of said radiation emitting semiconductor devices or said

radiation emitting solid-state devices being disposed in a second plane not coextensive with said first plane; and

electrical conductors carried by said elongate member and connected to said radiation emitting semiconductor devices or said radiation emitting solid-state devices to supply electrical power thereto;

The reference further discloses that the elongate member is configured to conduct heat away from said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices, with the aid of an optional heat dissipation member 30 (note that heat dissipation member is not a requirement as evident by the disclosures in column 5, first paragraph, column 6, lines 38-44, or by the claimed invention of claim 1), but does not explicitly discloses that said heat removing away from said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices is to transfer the heat to fluid contained by said elongate member as claimed.

Nevertheless, the reference discloses that said elongate thermally conductive member 21 could be an elongate hallow member (column 3, lines 42-47). As such, the elongate hallow thermally conductive member must contain a fluid (air) since the reference fails to disclose that the elongate hallow thermally conductive member is devoid of air (i.e., the reference fails to disclose efforts to remove the naturally occurring air in the elongate hallow thermally conductive member). Since the fluid (air) is naturally present in this embodiment, this embodiment discloses or appears to disclose that the elongate thermally conductive member is configured to conduct heat away from said at least one or said plurality of said solid-state light sources or from

said radiation emitting semiconductor devices or from said radiation emitting solid-state devices to naturally occurring fluid (air) contained by said elongate thermally conductive member.

Referring to **claims 3, 17, 24, 38, 45, and 59**, as noted above, the internally hollowed, elongate member of one embodiment of the '900 patent inherently comprises air, which is a thermal transfer media, since the reference fails to disclose otherwise.

Referring to **claims 5, 26, and 47**, the elongate hallow thermally conductive member comprises a tube (column 3, lines 45-50 – with circular cross section).

Referring to **claims 7, 28, and 49**, the '900 patent further discloses that said tube has a cross-section having flat portions.

Referring to **claims 6, 11-13, 27, 32-34, 48, and 53-55,** the elongate thermally conductive member 21 is a tubular member having a circular cross-section, a polygon cross-section, or a triangular cross-section (column 3, lines 45-50).

Referring to **claims 14-16, 20-21, 35-37, 41-42, 56-58, and 62-63**, the reference further discloses a flexible circuit/insulating layer (221/2211, best seen in Figs. 1 and 4) carried on a surface of said elongate thermally conductive member. The reference further discloses that said flexible circuit/insulating layer comprises said electrical conductors 220. The reference further discloses that said flexible circuit comprises a plurality of apertures ("window" 2212, Fig. 4, wherein "apertures" are interpreted broadly) for receiving said plurality of said solid-state light sources or said radiation emitting semiconductor devices or said radiation emitting solid-state devices. The reference further discloses that each of said solid-state light sources 222 or said radiation emitting semiconductor devices 222 or said radiation emitting solid-state devices 222 is disposed in a corresponding one of said apertures and affixed in thermally conductive contact

with said elongate thermally conductive member (column 4, lines 15-19, "a plurality of luminary elements 222 is adapted to be mounted on the peripheral surface 213 of the supporting frame 21 within the guiding windows 2212", bearing in mind that peripheral surface is an outer surface and that the supporting frame is of good heat conduction material).

Claim Rejections - 35 USC § 102

3. **Claims 1-3, 5, 7, 17, 22-24, 26, 28, 38, 43-45, 47, 49, and 59** are rejected under 35 U.S.C. 102(e) as anticipated by or Verds et al. U.S. Patent 6,425,678 (the '678 patent).

The '678 patent discloses in Figures 1-6, particularly Fig. 3, and respective portions of the specification a device as claimed. Specifically, the reference discloses a radiation emitting source ("LED obstruction lamp") 10 (Fig. 1) having an internal illuminating unit 30 (Fig. 3), a base 18, and a fixture 11 (lens 11), wherein the internal illuminating unit comprises a metal cylinder 35, which acts as a heat sink and which is configured to conduct heat away from high power LEDs 31 (column 3, lines 44-55).

In particular, with reference to **claim 1** and using the same references, citations, and interpretations as detailed above where applicable, the '678 patent discloses a light source comprising:

an elongate thermally conductive member (metal cylinder 35, "specifically designed to be made of a metal which provides a heat sinking for the first plurality of LEDs 31", column 3, lines 44-55) having an outer surface;

at least one solid-state light source (31) carried on said elongate member outer surface;

one or more electrical conductors (not shown, but must be present for the LEDs, which require electrical power to function, to function) carried ("carried" is interpreted broadly or as

broadly as the claims) by said elongate thermally conductive member and connected to said at least one solid-state light source to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said at least one solid-state light source (as noted above) to fluid contained by said elongate thermally conductive member (the elongate thermally conductive member 35 must be hallow to accept the LEDs 31 and the inherent electrical conductors, which are hidden from the view of Fig. 3, the must-be-hallow elongate thermally conductive member must contain fluid (air) therein since the reference does not disclose otherwise (i.e., no attempts are disclosed to deliberately make the inside of the hallow elongate thermally conductive member a vacuum, i.e., no air).

Referring to **claim 2** and using the same references, citations, and interpretations as detailed above where applicable, the reference discloses a light source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of solid-state light sources (31) carried on said elongate member outer surface at least some of said solid-state light sources being disposed in a first plane and others of said solid-state light sources being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of solid-state light sources to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said solid-state light sources to fluid contained by said elongate thermally conductive member.

Referring to **claims 22 and 23** and using the same references, citations, and interpretations as detailed above where applicable, the reference discloses a radiation emitting source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of radiation emitting semiconductor devices (31) carried on said elongate member outer surface at least some of said radiation emitting semiconductor devices being disposed in a first plane and others of said radiation emitting semiconductor devices being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said radiation emitting semiconductor devices to fluid contained by said elongate thermally conductive member.

Referring to **claims 43 and 44** and using the same references, citations, and interpretations as detailed above where applicable, the reference discloses a radiation emitting source comprising:

an elongate thermally conductive member having an outer surface;

a plurality of radiation emitting solid-state devices (31) carried on said elongate member outer surface at least some of said radiation emitting solid-state devices being disposed in a first plane and others of said radiation emitting solid-state devices being disposed in a second plane not coextensive with said first plane;

electrical conductors carried by said elongate thermally conductive member and connected to said plurality of light emitting diodes to supply electrical power thereto; and

said elongate thermally conductive member being configured to conduct heat away from said radiation emitting solid-state devices to fluid contained by said elongate thermally conductive member.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 4, 6, 8-13, 18, 25, 27, 29-34, 39, 46, 48, 50-55, and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '491 patent for being obvious or in view of Kiraly et al. U.S. Patent Application Publication 2003/0174517 (the '517 publication, cited in the previous Office Action).

Referring to **claims 4, 8-10, 18, 25, 29-31, 39, 46, 50-52, and 60**, the '491 patent discloses a device as claimed and as detailed above including elongated thermally conductive member (aluminum composite tube) 12 carrying on its outer surface solid-state high intensity light sources 24, 26,..., but fails to disclose that the elongated thermally conductive member 12 comprises heat dissipation protrusions or channels for thermal transfer.

However, change to the elongated thermally conductive member (aluminum composite tube) 12 to include heat dissipation protrusions or channels for thermal transfer would have been obvious for at least one of the following two reasons:

(1) It is known that increasing surface of or adding channels to a thermal dissipating device would increase the thermal dissipating capabilities of the device and it is known that high intensity light sources would require some form of thermal dissipating. Hence it follows that, at the time the invention was made, one of ordinary skill in the art would recognize that adding protrusions or channels to the elongated thermally conductive member (aluminum composite tube) 12 would increase the surface area of the device and/or thermal dynamics, which in turn would increase the thermal dissipating capabilities of the device, which in turn would help with thermal dissipating of high solid-state high intensity sources - which would require some form of thermal dissipation - carried by the elongated thermally conductive member (aluminum composite tube) 12; and

(2) The '517 publication, in disclosing an extensible linear light emitting diode illumination source comprising aluminum base 28, PCB base 10, and high intensity LED array 12, teaches that modifying aluminum base 28 to include extrusions ("extruded aluminum") would increase thermal dissipation ("for maximum heat dissipation") (paragraph [0034]) and to include channels (30) for cooling the illumination sources (12) (Abstract and paragraph [0013]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the high-intensity-LED-carrying elongated thermally conductive member (aluminum composite tube) 12 of the '491 patent to include aluminum extrusions and channels or aluminum composite extrusions and channels. One would have been motivated to make such a modification in view of the suggestion in the '517 publication that aluminum base 28 including extrusions or channels would increase thermal dissipation. Note also that, as detailed above for the independent claims, aluminum composite in the instant case as disclosed by the '491 patent,

just like aluminum, should be excellent heat conductors. Note also that although the '517 patent does not suggest the "extrusion" and channel modification to a ski pole, the publication does suggest the "extrusion" and channel modification to a solid-state emission source, and the '491 patent's ski pole is a solid-state emission source.

Referring to **claims 6, 11-13, 27, 32-34, 48, and 53-55,** the elongate thermally conductive member 12 is a tubular member having a circular cross-section. Although the '491 patent fails to disclose that said tubular member has a polygon cross-section or a triangular cross-section, the various cross-section configurations are just different configurations one of ordinary skill in the art would find obvious for supplying elongate thermally conductive members, and therefore would not be patentable.

5. **Claims 4, 8-10, 18, 25, 29-31, 39, 46, 50-52, and 60** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent for being obvious or in view of the '517 publication.

The '900 patent discloses in one embodiment a device as claimed and as detailed above including elongated hallow thermally conductive member 21 carrying on its outer surface solid-state radiation emitting device 31 but fails to disclose that the elongated thermally conductive member comprises heat dissipation protrusions or channels for thermal transfer.

However, change to the elongated thermally conductive member to include heat dissipation protrusions or channels for further thermal transfer would have been obvious for at least one of the following two reasons:

(1) It is known that increasing surface of or adding channels to a thermal dissipating device would increase the thermal dissipating capabilities of the device and it is known that high

efficiency solid-state light sources with enhanced brightness and increased cooling effect (column 1, lines 5-10) would require effective thermal dissipating. Hence it follows that, at the time the invention was made, one of ordinary skill in the art would recognize that adding protrusions or channels to the elongated thermally conductive member would increase the surface area of the device and/or thermal dynamics, which in turn would increase the thermal dissipating capabilities of the device, which in turn would help with thermal dissipating of high efficiency solid-state light sources; and

(2) The '517 publication, in disclosing an extensible linear light emitting diode illumination source comprising aluminum base 28, PCB base 10, and high intensity LED array 12, teaches that modifying aluminum base 28 to include extrusions ("extruded aluminum") would increase thermal dissipation ("for maximum heat dissipation") (paragraph [0034]) and to include channels (30) for cooling the illumination sources (12) (Abstract and paragraph [0013]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the high-power-LED-carrying elongated thermally conductive member of the '491 patent to include aluminum (or other metal) extrusions and channels. One would have been motivated to make such a modification in view of the teachings in the '517 publication that a metal base including extrusions or channels would increase thermal dissipation.

6. **Claims 4, 6, 8-13, 18, 25, 27, 29-34, 39, 46, 48, 50-55, and 60** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '678 patent for being obvious or in view of the '517 publication.

Referring to **claims 4, 8-10, 18, 25, 29-31, 39, 46, 50-52, and 60**, the '678 patent discloses a device as claimed and as detailed above including elongated thermally conductive member 35 carrying on its outer surface solid-state high power LEDs 31 but fails to disclose that the elongated thermally conductive member comprises heat dissipation protrusions or channels for thermal transfer.

However, change to the elongated thermally conductive member ("specifically designed to be made of a metal which provides a heat sinking for the first plurality of LEDs 31") 12 to include heat dissipation protrusions or channels for thermal transfer would have been obvious for at least one of the following two reasons:

(1) It is known that increasing surface of or adding channels to a thermal dissipating device would increase the thermal dissipating capabilities of the device and it is known that high power light sources would require some form of thermal dissipating. Hence it follows that, at the time the invention was made, one of ordinary skill in the art would recognize that adding protrusions or channels to the elongated thermally conductive member would increase the surface area of the device and/or thermal dynamics, which in turn would increase the thermal dissipating capabilities of the device, which in turn would help with thermal dissipating of high power light sources; and

(2) The '517 publication, in disclosing an extensible linear light emitting diode illumination source comprising aluminum base 28, PCB base 10, and high intensity LED array 12, teaches that modifying aluminum base 28 to include extrusions ("extruded aluminum") would increase thermal dissipation ("for maximum heat dissipation") (paragraph [0034]) and to include channels (30) for cooling the illumination sources (12) (Abstract and paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the high-power-LED-carrying elongated thermally conductive member of the '491 patent to include aluminum (or other metal) extrusions and channels. One would have been motivated to make such a modification in view of the teachings in the '517 publication that a metal base including extrusions or channels would increase thermal dissipation.

Referring to **claims 6, 11-13, 27, 32-34, 48, and 53-55,** the elongate thermally conductive member is a tubular member 35 having a cross-section. Although the '678 patent fails to explicitly disclose that said tubular member has a circular cross-section or a triangular cross-section or a polygon cross-section (although column 3, lines 44-46, on the one hand describes a cylinder shape – thus would have a circular cross-section - Figure 3 on the other hand appears to depict a polygon – thus would have a polygon cross-section), the various cross-section configurations are just different configurations one of ordinary skill in the art would find obvious for supplying elongate thermally conductive members, and therefore would not be patentable.

7. **Claims 14-16, 20-21, 35-37, 41-42, 56-58, and 62-63** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '678 patent in view of the '794 patent).

The '678 patent discloses a device as claimed and as detailed above including elongated thermally conductive member carrying inherent, hidden-from-view electrical conductors, wherein the member carries on its outer surface solid-state high power light source, but fails to disclose a flexible circuit/insulating layer carried on a surface of said elongate thermally conductive member. The reference in effect further fails to disclose that said flexible circuit/insulating layer comprises said electrical conductors. The '794 patent, in disclosing a

lighting unit in Figs. 3 - 5, including elongated member 40 comprising elongated flexible printed circuit board 10, elongated housing 42, and LEDs 18, teaches that the use of printed circuit board takes advantage of mass production processes which have been developed for automatic placement of LEDS (and the inherent printed electrical conductors – "printed" - and the required apertures for receiving the LEDs) (column 2, lines 20-29) and that printed flexible circuit board 10, being flexible, can be wrapped around cylindrical housing 42 (Abstract, "the circuit board, being flexible, is wrapped around a cylindrical housing, with LED packages being directed radially outward"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to change the simple tube 35 of the device of the '678 patent to include a flexible printed circuit board/insulating layer wrapping around the tube. One would have been motivated to make such a modification in view of the suggestion in the '794 patent that printed circuit boards allow utilization of mass production processes which have been developed for automatic placement of LEDS and that a flexible printed circuit board would allow utilization of mass-production-technique placement of LEDS on and around the tube. In addition, the simple fact that the '678 patent's lamp is subjected to significant handling (column 4, lines 36-40), adds the more motivation to one of ordinary skill, in the lighting art, to change the simple tube carrying high power lighting elements with a flexible printed circuit board/insulating layer to offset for the extensive handling, as it is known that being rigid is prone to accidental breaking more often than being flexible.

8. **Claims 19, 40, and 61** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '900 patent for being obvious.

The '900 patent discloses a device as claimed and as detailed above including elongated thermally conductive member, and further discloses that the elongated thermally conductive member is housed in a fixture 24 ("light shelter" 24, which is "an object firmly fixed in place", the definition of fixture, column 4, lines 35-40). The reference, however, fails to disclose using a clip (securing device, for mounting said elongate thermally conductive member in the fixture) as claimed. Nevertheless, the various securing devices, clip as claimed or appear-to-be-self-adhesive as disclosed, are just different configurations one of ordinary skill in the art would find obvious for mounting or securing elongate thermally conductive members into a fixture, and therefore would not be patentable.

9. **Claims 19, 40, and 61** are rejected under 35 U.S.C. 103(a) as being unpatentable over the '678 patent for being obvious.

The '678 patent discloses a device as claimed and as detailed above including elongated thermally conductive member, and further discloses that the elongated thermally conductive member is housed in a fixture 11/18 (lens and base). The reference, however, instead of using a clip (securing device) for mounting (said elongate thermally conductive member in the fixture) as claimed, use a clamp (securing device) 17 (column 4, lines 40-44). Nevertheless, the various securing devices, clip or clamp, are just different configurations one of ordinary skill in the art would find obvious for mounting or securing elongate thermally conductive members into a fixture, and therefore would not be patentable.

10. Applicant's arguments with respect to claims 1-63, filed 05/09/2005, have been fully considered but they are not persuasive.

a. With respect to Applicant's arguments on pages 18 and 19 that aluminum composite, the material that the '491 patent's elongate member 12 is formed of, does not conduct heat, it is respectfully pointed out that any material conducts heat to some degree. As reported in *Thermal Conductivity Science*, Hukseflux Thermal Sensors, of the different materials listed in the tables, at 20 degree C, air has the poorest thermal conductivity (0.025, first line, first table). Aluminum has a thermal conductivity of 237 (line 10, first table). Aluminum Oxide has a thermal conductivity of 30 (line 13, first table). Even the so-called insulation material (Plastic insulation materials, table 1, last line) has a thermal conductivity of 0.03, which is higher than that of air. It then is appropriate in the instant case to conclude that the '491 patent's elongate aluminum composite 12 is an elongate thermally conductive member. Furthermore, as air, as in this case air that surrounds the outside of the elongate thermally conductive member, has the poorest thermal conductivity of the known materials, it is appropriate to state that the elongate thermally conductive member is configured or appears to be configured to conduct heat away from said at least one or said plurality of said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices to fluid (air) naturally contained by said elongate thermally conductive member as the aluminum composite conducts more heat than does the surrounding air. It should be emphasized, however, that even if thermal conductivity of the aluminum composite is less that that of air, the aluminum composite nevertheless conducts heat to some degree and thus it is still appropriate to state that the elongate thermally conductive member is configured or appears to be configured to conduct heat away

from said at least one or said plurality of said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices to fluid naturally contained by said elongate thermally conductive member. Note also that the limitation "being configured" generally does not carry patentable weight in a claim unless the claim results in a structural difference as compared to a prior art device.

b. With respect to Applicant's arguments on page 20 that the '491 patent's LED is not carried on the elongate thermally conductive member outer surface, the '491 patent's LED is carried on the elongate thermally conductive member outer surface as "carry" is interpreted to be To have (something) on the surface or skin[1]. The fact that the LED 42 has a flange does not make it not carried on the outer surface of the elongate thermally conductive member 12.

c. With respect to Applicant's arguments on pages 23-25 that the LED's cover disclosed by the '491 patent is formed from a poor thermal conductor, it nevertheless conducts thermal energy. Despite that fact that the LED's leads conduct and dissipate heat, the LED's cover also conducts and dissipates heat. In addition, Applicant pointed to specific LED models disclosed in U.S. Patent 5,033,212, but those models are not what disclosed or claimed by the '491 patent.

d. With respect to Applicant's arguments on pages 27-28 that the ski pole (the elongate member, which is a "tube" in the instant claim) does not have flat portions, it is respectfully pointed out that the claim requires "said tube has a cross-section having flat portions", not "said tubes has flat portions". In a cross-section view, the tube of the '491 patent, similar to the tube of the present invention, is seen as having a number of (continuously connected) flat portions.

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e. With respect to Applicant's arguments on pages 29-31 that the entirety of the teachings of the '900 patent is directed to the transfer of heat from the LEDs to the massive heat sink, it is respectfully pointed out, as detailed above and previously, that the massive heat sink is optional and that in one embodiment, the elongate thermally conductive member is hallow. As admitted by Applicant, the elongate thermally conductive member is of good heat conduction material; as such the heat generated from the LEDs dissipates equally to the air, inside and outside. It should be emphasized, however, that regardless of the materials used, the elongate thermally conductive member still conducts heat to some degree and thus it is still appropriate to state that the elongate thermally conductive member is configured or appears to be configured to conduct heat away from said at least one or said plurality of said solid-state light sources or from said radiation emitting semiconductor devices or from said radiation emitting solid-state devices to fluid naturally contained by said hallow elongate thermally conductive member.

On page 32, Applicant appears to indicated that the air in the hallow elongate thermally conductive member ("the support structure") is trapped in the totally enclosed support structure. However, that situation is not what taught by the '900 patent. As noted above, the '900 patent simply teaches that the supporting frame can be hallow, and that the heat sink is optional.

Note also that the limitation "being configured" generally does not carry patentable weight in a claim unless the claim results in a structural difference as compared to a prior art device.

f. Referring to Applicant's arguments on pages 34 that that the conductors of the '678 patent are not supported by the cylinder (35), it is reminded that the limitation is not in the claim.

With respect to the arguments on pages 33-34 that the electrical conductors are not carried by the cylinder 35, it is respectfully pointed out that the electrical conductors are carried by the cylinder 35. As correctly pointed out by Applicant, the electrical conductors must be connected to the LEDs (for them to function). Since the LEDs are carried by the cylinder and since the electrical conductors are connected to the LEDS, the electrical connectors are carried by the cylinder. There are plenty of examples where "carry" does not require that the entirety of the object has to be on a surface of or embedded inside the subject. For example, "the traffic carried by the bridge", which limitation does not carry the meaning that the entirety of the traffic is embedded in the bridge on a surface of the bridge. And "the passengers carried by the motorcycle", which limitation does not require that the entirety of each of the passengers has to be embedded in the motorcycle or that the entirety of each of the passengers has to be on a surface of the motorcycle; it only requires a portion of each of the passengers contacts the motorcycle.

g. With respect to Applicant's arguments on pages 34-35 that the '678 does not suggest or teaches that heat is conducted away from the LEDs to fluid (air) contained in member 35, it is respectfully pointed out that the '678 teaches that heat is conducted away from the LEDs to fluid (air) contained in member 35. Despite the fact that a portion of the heat generated by the LEDs might be conducted to the base 18, the heat generated by the LEDs are conducted to the air inside the cylinder 35. The '678 reference does not have to explicitly teach or claim that heat generated by the LEDs are conducted to the air inside the metal cylinder 35, the heat generated by the LEDs are conducted to the air inside the metal cylinder 35, despite the fact that a portion of the heat generated by the LEDs might be conducted to the base 18 and that the two ends of the metal tubes are closed.

h. With respect to Applicant's arguments on pages 36-37 that the '491 patent does not teach that the aluminum composite ski pole is utilized as a thermally conductive member, the '491 patent does not have to explicitly teach that the aluminum composite ski pole is utilized as a thermally conductive member. As detailed above, the aluminum composite ski pole conducts heat better than the surrounding air, therefore the aluminum composite ski pole is utilized as a thermally conductive member. With respect to Applicant's comments on the age of the reference, it is respectfully reminded that the test for obviousness applied at the time the claimed invention was made: "...if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains"). Regardless, Light emitting diodes (LEDs), at the time the references were written, at the time the invention was made, and today, still are diodes emitting light, heat and radiation. And, a person having ordinary skill in the art, at the time the invention was made, sought a way to utilize the LEDs available at the time the invention was made.

As for the assertion that the protrusions would reduce the resiliency of the ski pole, that is only Applicant's opinion.

i. With respect to Applicant's arguments on pages 41-42 that the elongate thermally conductive member 21 does not dissipate heat because the function of the elongate thermally conductive member 21 is to transfer heat to heat dissipater 30, it is respectfully pointed out, as detailed above, that the embodiment used to reject the claims is that without the heat dissipater 30 and that the elongate thermally conductive member 21 is a hallow elongate thermally conductive member.

j. With respect to Applicant's arguments on pages 43-44 that heat does not transfer to the air inside the metal cylinder 35, as detailed above, heat does transfer to air inside the metal cylinder 35. As for the arguments that a person having ordinary skill in the art at the time the invention was made would not be motivated to add heat dissipation elements to the interior of a closed cylinder, the modification, as recited in the pertinent claims and as detailed above, does not involve a specific side of the metal cylinder.

k. Referring to Applicant's arguments on pages 45-46 that the metal cylinder 35 is a polygon cross-section, it is respectfully pointed out that the '678 patent does not disclose that the metal cylinder 35 is a polygon cross-section. The metal member in Fig. 3 may look like a polygon, but the reference discloses and claims a metal cylinder. As for the argument that the sealed unit is unlikely to be subjected to handling, it is respectfully pointed out that being likely to be subjected to handling is the reason the device is sealed ('the 678 patent, column 4, lines 35-40) and is called an obstruction lamp.

Conclusion

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TH

Tu-Tu Ho
July 22, 2005